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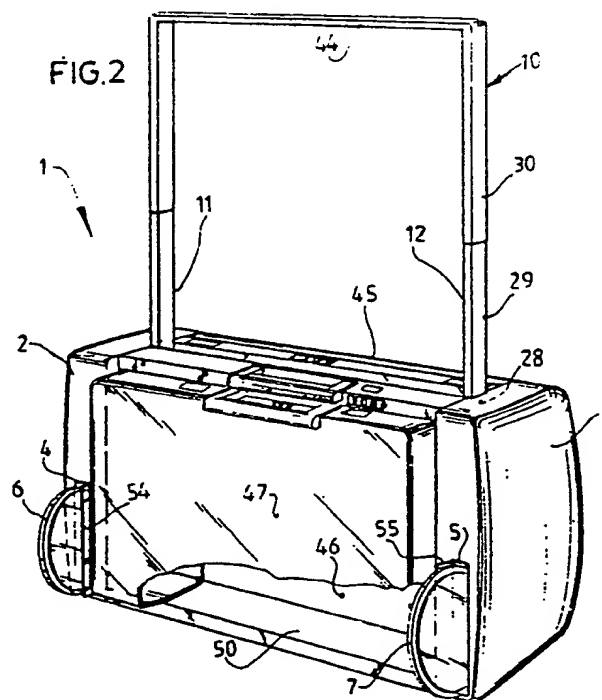
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(54) Suitcase frame.

(57) A suitcase frame (1) provided with means to carry luggage and a document suitcase as well. The frame is provided with carrying wheels (6, 7) pivotable between a position inside the frame (1) and an operable position outside the frame (1). The wheels (6, 7) are actuated by the handle (10) of the suitcase frame (1).



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SUITCASE FRAME

The invention relates to a suitcase frame. The transportation and handling of suitcases forms a continual problem for different reasons. If a large suitcase is chosen then one encounters the drawback that it becomes heavy and awkward to handle. An attempt has been made to solve this problem by providing larger suitcases with carrying wheels. However, small-size carrying wheels are chosen in order not to make the use of the suitcase awkward for the user. Because of this the suitcase rolls with difficulty when it is pulled along. Use is further made of portable folding framework-type frames onto which the suitcase is laid in order to enable it to be pulled along. The carrying of such a fram is awkward however. Moreover, certain requirements are made of suitcases in respect of the dimensions, particularly when these are used as so-called hand luggage in air traffic. If a suitcase is to be taken into the airplane then it must be stowable in the luggage space above the seating areas or under the seat or it has to be possible to place it against the edge of the seat covered by the legs of the seated passenger. Smaller suitcases do of course comply with this requirement but these have the drawback of limited carrying volume.

The invention has for its object to provide a suitcase which, in view of the dimensions thereof, can be used as so-called hand luggage, has a reasonable, preferably divisible capacity, on the one side for instance for clothing, and on the other side for documents, and which can moreover be transported without all too great a physical effort.

This is achieved using a suitcase frame, consisting of double walls arranged parallel to and at a distance from each other, a carrying wheel in each of the double walls pivotable between a rest position in the double wall and an active position outside that space and an actuating system for causing the carrying wheels to pivot.

With such a suitcase frame there is the possibility of causing the carrying wheels to pivot outwards for transportation and of making the suitcase roll forwards, and, for the non-transporting position, of causing the wheels to pivot into the space between the double walls so that the suitcase can be handled like any other suitcase.

The actuating system is preferably coupled to a bracket slidable in lengthwise direction of the walls, such that when the bracket is extended the carrying wheels are in the position outside the space in the double walls and when the bracket is retracted the carrying wheels are inside this space.

The bracket, which is for example U-shaped and whereby each leg of the U is inserted into a double wall, is used as both actuator for the actuat-

ing system for the carrying wheels and in extended position as pulling bracket for transporting the suitcase. In order to achieve a sufficient length for the pulling bracket the legs preferably consist of telescopically extendable parts. For enabling the bracket to withstand compressing loads encountered during use, the bracket is preferably provided with means for fixing it in its fully extended position.

As well as performing a pivoting movement while swivelling into the active position the rotating shafts of the carrying wheels also perform a translation movement.

Owing to the coupling of the extension movement of the pulling bracket and the pivoting of the carrying wheels to or from the active position both the pivoting movement of the carrying wheels and the extension movement of the legs of the U-shaped bracket are synchronized. This is important since if extension of the legs of the U is non-synchronized there is the danger that they will go out of square and jam.

Arranged between the walls of the frame is a first suitcase. A second suitcase can be detachably arranged against the bottom wall of the first suitcase. The first suitcase can thereby be a clothing suitcase for example, while the second suitcase can be a so-called attache case. The first suitcase can have a moveable bottom connected to the side walls over a bellows construction. In the absence of the second attache case the bottom wall of the first suitcase can be brought outwards so that the loading space is enlarged. The first suitcase preferably has a rounded upper wall such that when the suitcase frame with suitcase is disposed on the floor against the seat for example of an airplane seat the user is not thereby obstructed since the suitcase matches the shape of the seat.

Other features and advantages of the invention will become apparent from the description of embodiments as according to the annexed drawings. In the drawings:

fig. 1 shows in perspective view and in dismantled state the suitcase frame with two suitcases arranged therein,

fig. 2 shows the suitcase frame according to the invention with extended bracket and carrying wheels moved outwards,

fig. 3 shows in perspective view the suitcase frame in the transporting position,

fig. 4 shows in perspective view an embodiment of the actuating system for the carrying wheels,

fig. 5 shows a partial sectional perspective view of the suitcase frame in the transporting position,

fig. 6 shows a sectional perspective view along the line VI in fig. 5,

fig. 7 shows a perspective view along the line VII in fig. 1.

The suitcase frame 1 consists substantially of two double walls 2 and 3 arranged parallel to and at a distance from each other, a bottom part 50 dividing the walls, and the U-shaped pulling bracket 10, which is coupled to an actuating system for the carrying wheels 6, 7 such that when the bracket 10 is extended (fig. 2 and 3) the carrying wheels are in the active position and when it is in the retracted position (fig. 1) the wheels are in the rest position. In the suitcase frame are a pair of cases, a comparatively larger case 45 and a comparatively smaller case, a so-called attache case, 47. The attache case 47 is removable (fig. 1) and can be used as a case independently. The bottom wall 46 of the first case is preferably movable using the bellows construction 48 so that it can be moved as according to the arrow in fig. 1 in order to be able to enlarge the packing space when the attache case 47 is absent. The whole can be carried using the carrying grip 52, which is movable in the slot 53. Depending on the presence of the attache case 47 the carrying grip 52 can be placed in the slot 53 in the most favourable position relative to the centre of gravity.

In the rest position the carrying wheels 6, 7 are held in the space 4, 5 in the respective double walls 2, 3. In the rest position the access space for the wheels is closed off by the respective flaps 54 and 55. The flap is biased to the closed position. The suitcase displays on one side a rounded form 49 such that when the suitcase is placed against a seat in an airplane the user sitting on the seat is not obstructed.

Arms 56, 57 are retractable into and extendable out of the bottom part 50, which arms can serve in the extended position (fig. 3) to accommodate a third suitcase or bag lying separately on the suitcase frame.

The legs 11, 12 of the U-shaped bracket 10 consist of three telescopically extendable parts 28, 29, 30.

The actuating system 8 comprises a pivot arm 19 which is connected to the relevant carrying wheel 6. The pivot arm is pivotable around the pivot shaft 18 which is slidable in the slot 15. Present in the pivot arm 19 is a channel-shaped guiding track 17 in which can move a roller 20 connected to the bracket 10. When the bracket is pulled out the roller 20 moves in the channel-shaped guiding track 17 and forces this into pivot-

ing to the outside and into a translation through the slot 15, whereby the movement initially is a mainly pivoting movement and in the latter portion of the path a translation movement through the slot 15. In the operative position of the carrying wheel, that is, the position outside the space between the double walls, the pivot arm is fixed in form fitting manner by co-action of the nose 21 and the recess 22 in the pivot arm. A similar fixation occurs in the rest position using the nose 23 and the recess 24. The wheels are arrested in their active position using a stop member 25 which is under the influence of the leaf spring 26 and which can pivot around the pivot shaft 58. During the movement to the active position the stop member 25 falls with the nose 59 behind the angle-shaped recess 27. When the bracket 10 is pushed inward the stop member 25 is pushed aside so that disengagement takes place.

As can be seen for example from fig. 4, in the rest position the body 44 of the U-shaped bracket is recessed into the groove 60. The bracket 10 is fixed in this position by two commercially available latches 13, 14. Springs 62, 63 between the second telescopic part 29 of each leg 11, 12 of said bracket 10 and the bottom part 50 of said frame 1 ensure that said bracket 10 pops up upon release of said latches 13, 14.

For fixing the U-shaped bracket 10 in its fully extended position, fixation means 9 is provided. Figures 5 and 6 show one embodiment of the fixation means 9. In this embodiment the bottom part 50 of the suitcase frame 1 is provided with a doubler element 31 in line with each leg 11, 12 of the bracket 10, each said doubler element 31 being provided with a threaded opening 32 accommodating an adjustment screw 33. To the adjustment screw 33 is attached one end of the thinnest member 34 of a commercially available telescopic antenna 36, mounted inside the U-shaped bracket 10. To the other end of said thinnest antenna member 34 a flexible element 37 is attached, which runs along the inside of said telescopic antenna 36 in a snug fit, and which continues in a snug fit along the inside of tubular members 38, 39 that are connected to antenna 36 and that run the length of the body 44 of said U-shaped bracket 10. The length of the flexible element 37 is such, that when the bracket 10 is retracted, said flexible element 37 passes through a blocking element 40, but that when said bracket 10 is fully extended, said flexible element 37 stops just short of said blocking element 40. The blocking element 40 comprises a body 65, provided with at least one hole 66 running the length of said body 65, said body 65 being movably mounted in the body 44 of the U-shaped bracket 10 in such a way, that when said body 65 is in a first position, extending partly through an opening 67 in the lower skin of said body 44 of

said bracket 10, said body 65 acts to block the passage between the tubular members 38, 39, thereby prohibiting movement of said flexible element 37, whereas when said body 65 is in a second position, completely sunk into the body 44 of bracket 10, the hole 66 in said body 65 acts as a passageway between the tubular members 38, 39, thus allowing movement of said flexible element 37 through said tubular members 38, 39. The body 65 of blocking element 40 is spring mounted and biased to a passage blocking position.

The suitcase 45 is provided with an extra security measure in the form of a chain or cable 68 closable around for example a post or pillar or the like. In the rest position the cable 68 is wound around a biased spool 69 (fig. 7). By operating the combination lock 70 the panel 71 can be moved outwards, the cable 68 can be pulled from the spool and the loose end placed in a locking opening 72. Subsequently the panel 71 is closed again.

Claims

1. Suitcase frame (1), consisting of double walls (2, 3) arranged parallel to and at a distance from each other, a carrying wheel (6, 7) in each of said double walls (2, 3) that is pivotable between a rest position in the space (4, 5) in said double wall and an active position outside that space (4, 5) and an actuating system (8) for causing said carrying wheels (6, 7) to pivot.

2. Suitcase frame (1) as claimed in claim 1, **characterized in that** the actuating system (8) is coupled to a bracket (10) slidable in lengthwise direction of the walls, such that when said bracket (10) is extended the carrying wheels (6, 7) are in the position outside the space (4, 5) in the double walls (2, 3) and when said bracket (10) is retracted said carrying wheels (6, 7) are in the position inside said space (4, 5).

3. Suitcase frame (1) as claimed in claims 1-2, **characterized in that** the bracket (10) is U-shaped and each leg (11, 12) of the U is inserted into a respective double wall (2, 3).

4. Suitcase frame (1) as claimed in claim 3, **characterized in that** the legs (11, 12) consist of telescopically extendable parts (28, 29, 30).

5. Suitcase frame (1) as claimed in claims 1-4, **characterized in that** during pivoting to the active position the rotating shaft of the carrying wheels (6, 7) also performs a translation movement.

6. Suitcase frame (1) as claimed in claims 1-5, **characterized in that** the actuating system (8) consists of a pivot arm (19) connected to a carrying wheel (6), displaying a channel-shaped guiding track (15) and pivotable around a pivot shaft (18), in

addition to a slot-like guiding track (15) for said pivot shaft (18) and a roller (20) movable in said guiding track and connected to said bracket.

7. Suitcase frame as claimed in claim 6, **characterized by** form fitting blocking means (21, 22; 23, 24) for positioning the pivot arm in the active position and in the rest position.

8. Suitcase frame (1) as claimed in claim 7, **characterized by** a spring mounted (26) pivotable stop member (25) and co-acting therewith an angle-shaped recess (27) on the pivot arm (19) for arresting the pivoting of the carrying wheels (6, 7) in the active position.

9. Suitcase frame (1) as claimed in claims 2-8, characterized by means (9) for fixing the bracket (10) in its fully extended position.

10. Suitcase frame (1) as claimed in claim 9, characterized in that said means (9) comprises: telescopically slidable guides (36, 38, 39) mounted in said bracket (10), forming a guiding track (43); an element (37) made of flexible material, slideably accommodated in a snug fit in said guiding track (43), and attached with one end to the beginning of said guiding track (43) near the bottom part (50) of said frame (1);

a blocking element (40) movable between a first position in which the passage through said guiding track (43) is blocked and a second position in which the passage through said guiding track (43) is cleared;

the length of the element (37) being such, that said element (37) reaches within said blocking element (40) when the bracket (10) is fully extended, and passes through said blocking element (40) when said bracket (10) is retracted.

11. Suitcase frame (1) as claimed in claim 10, characterized in that in said bracket (10) are mounted two parallel guiding tracks (43, 51), each said guiding track (43, 51) accommodating a flexible element (37, 41), one element (37) being fixed near said bottom part (50) at one side of said frame (1), the other element (41) being fixed near said bottom part (50) at the other side of said frame (1).

12. Suitcase frame (1) as claimed in claim 11, characterized in that said blocking element (40) is mounted in said bracket (10) by means of a biasing spring (61), said biasing spring (61) being relaxed when said blocking element (40) is in the first position, blocking the passage through said guiding track (43, 51), and said biasing spring (61) being loaded when said blocking element (40) is in the second position, clearing the passage through said guiding track (43, 51).

13. Suitcase frame (1) as claimed in claim 12, characterized in that the beginning of each said guiding track (43, 51) is fixed to an adjustment

screw (33, 64) mounted in the bottom part (50) of said frame (1), allowing adjustment of the length of each said flexible element (37, 41).

14. Suitcase frame (1) as claimed in claims 2-13, characterized in that when the bracket (10) is retracted, the body (44) of said bracket (10) is recessed into a groove (60) in the upper part of said frame (1) and fixed in that position by latches (13, 14).

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15. Suitcase frame (1) as claimed in claim 14, characterized in that between the lower end of the second telescopic part (29) of each leg (11, 12) of the bracket (10) and the bottom part (50) of said frame (1) a biasing spring (62, 63) is provided, said biasing spring (62, 63) being loaded when said bracket (10) is fully retracted, and relaxed when said bracket (10) is extended so far that the body (44) of said bracket (10) is clear from the groove (60).

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16. Suitcase frame (1) as claimed in claims 1-15, characterized in that a first suitcase (45) is arranged between the walls (2, 3) of the frame (1).

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17. Suitcase frame (1) as claimed in claim 16, characterized in that the walls (2, 3) of the frame (1) are the walls of the suitcase (45).

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18. Suitcase frame (1) as claimed in claims 16, 17, characterized in that a second suitcase (47) is releasably arranged against the bottom wall (46) of the first suitcase (45).

19. Suitcase frame (1) as claimed in claims 16-18, characterized in that the first suitcase (45) has a displaceable bottom (46) which is connected to the side walls over a bellows construction (48).

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20. Suitcase frame (1) as claimed in claim 2, characterized in that the bracket (10) serves as pulling bracket.

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21. Suitcase frame (1) as claimed in claim 16, characterized in that the first suitcase (45) has a rounded upper wall (49).

22. Suitcase frame (1) as claimed in claim 13 and claim 16, characterized in that the bottom portion of the frame is a side wall (50) of the first suitcase.

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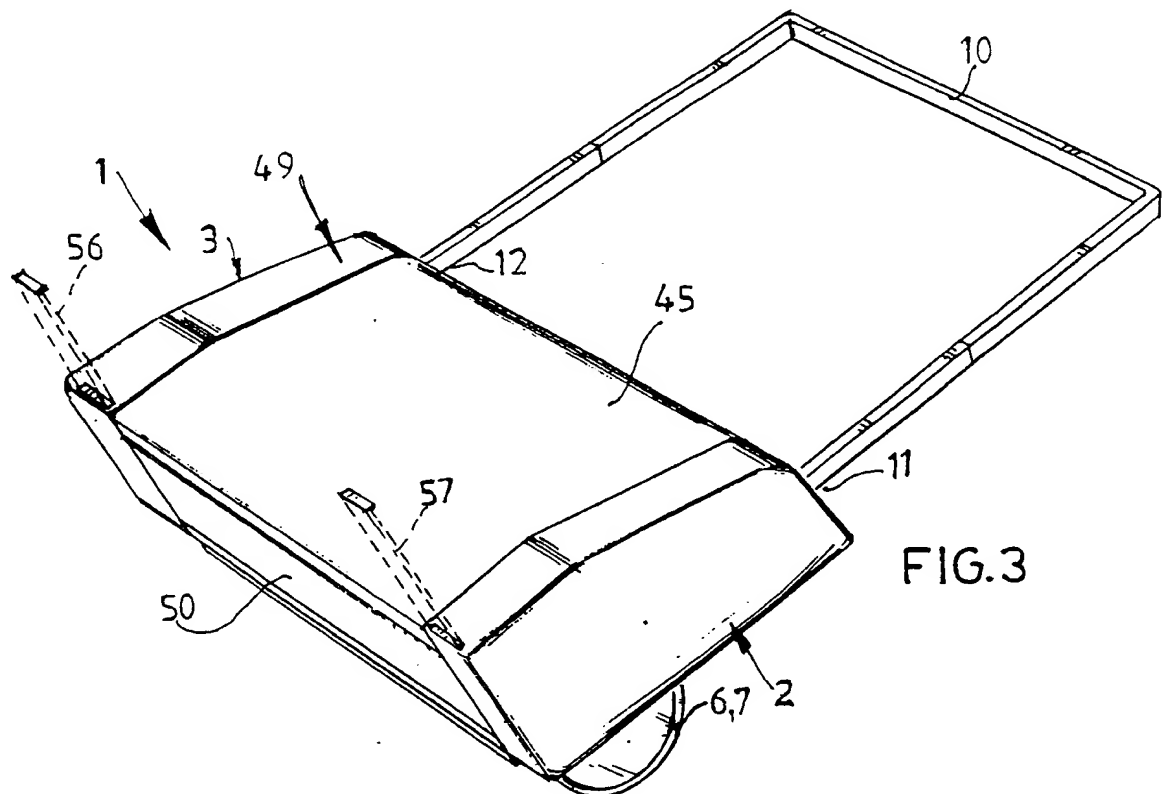
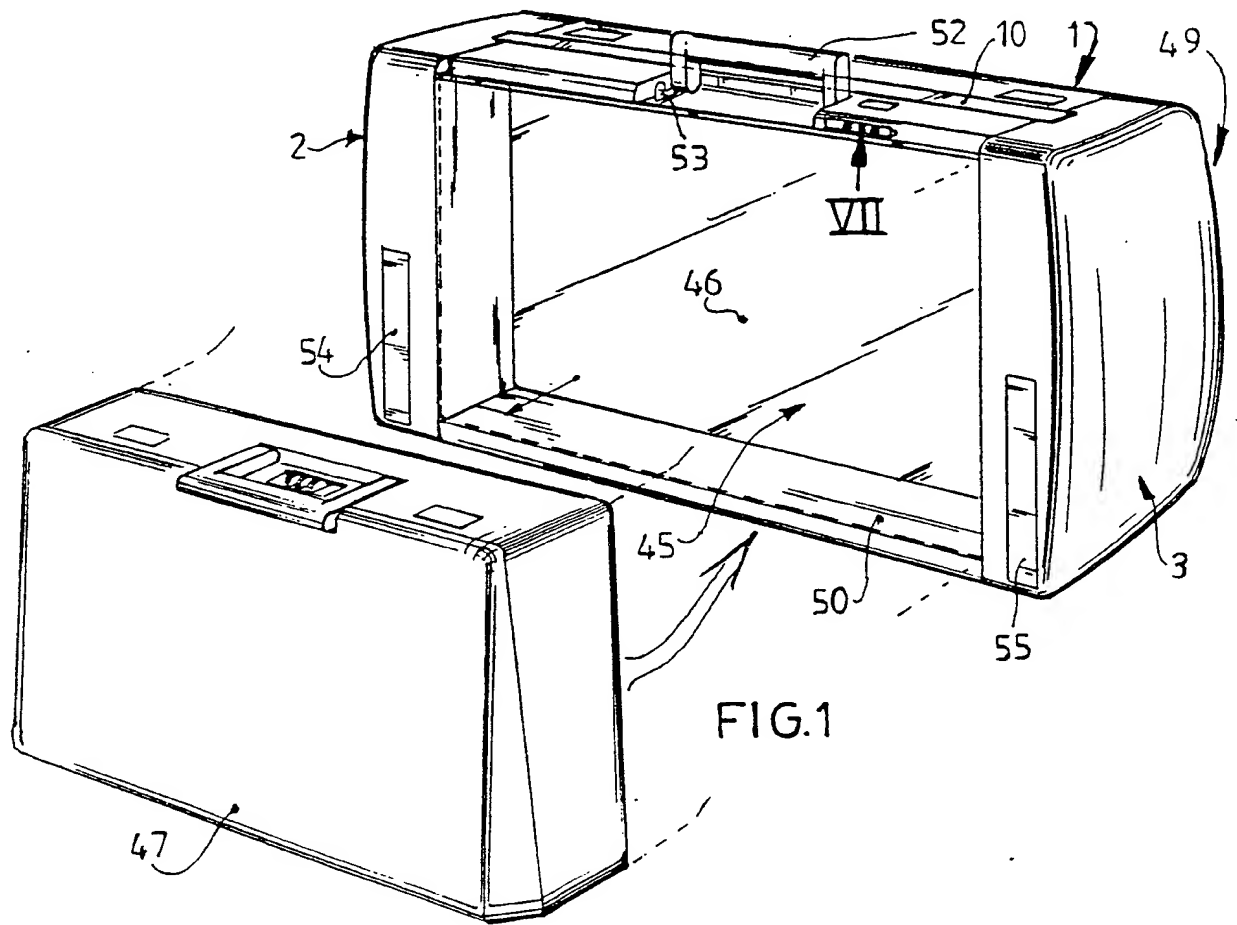
23. Suitcase frame (1) as claimed in claims 1-22, characterized in that the first suitcase (45) is provided with a carrying grip (52) movable in a slot (53).

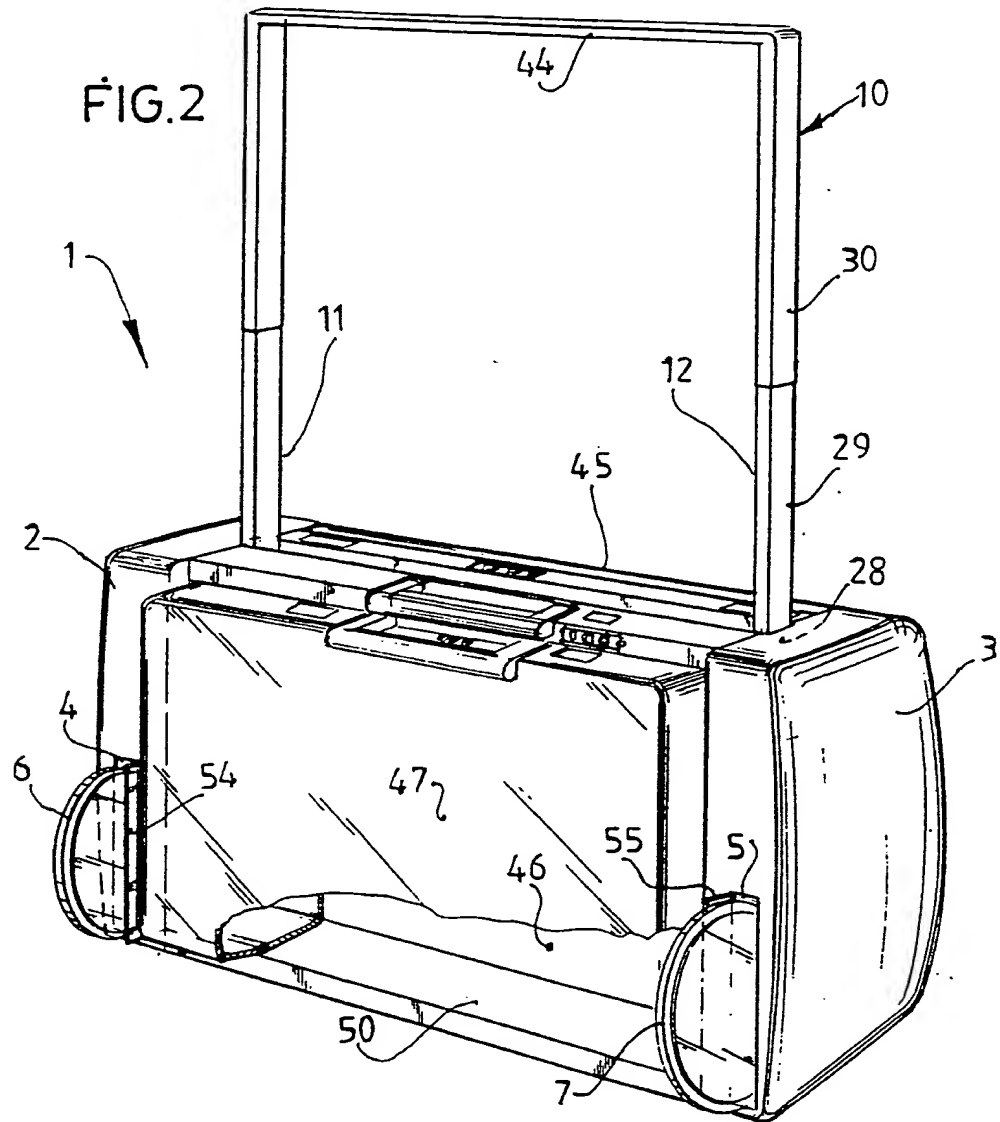
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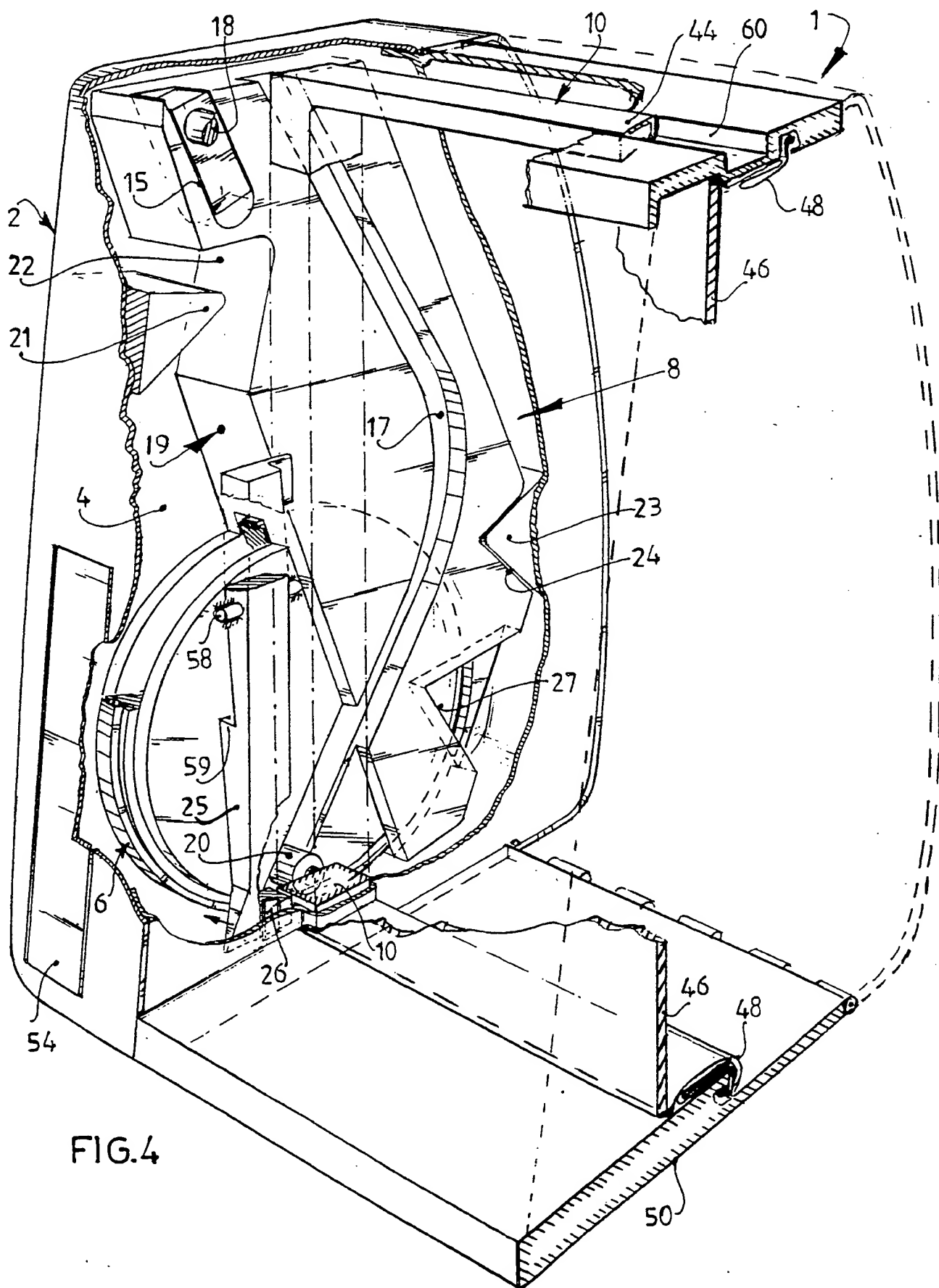
24. Suitcase frame (1) as claimed in claims 1-23, characterized by carrying arms (56, 57) on the frame (1) that are extendable in transverse direction.

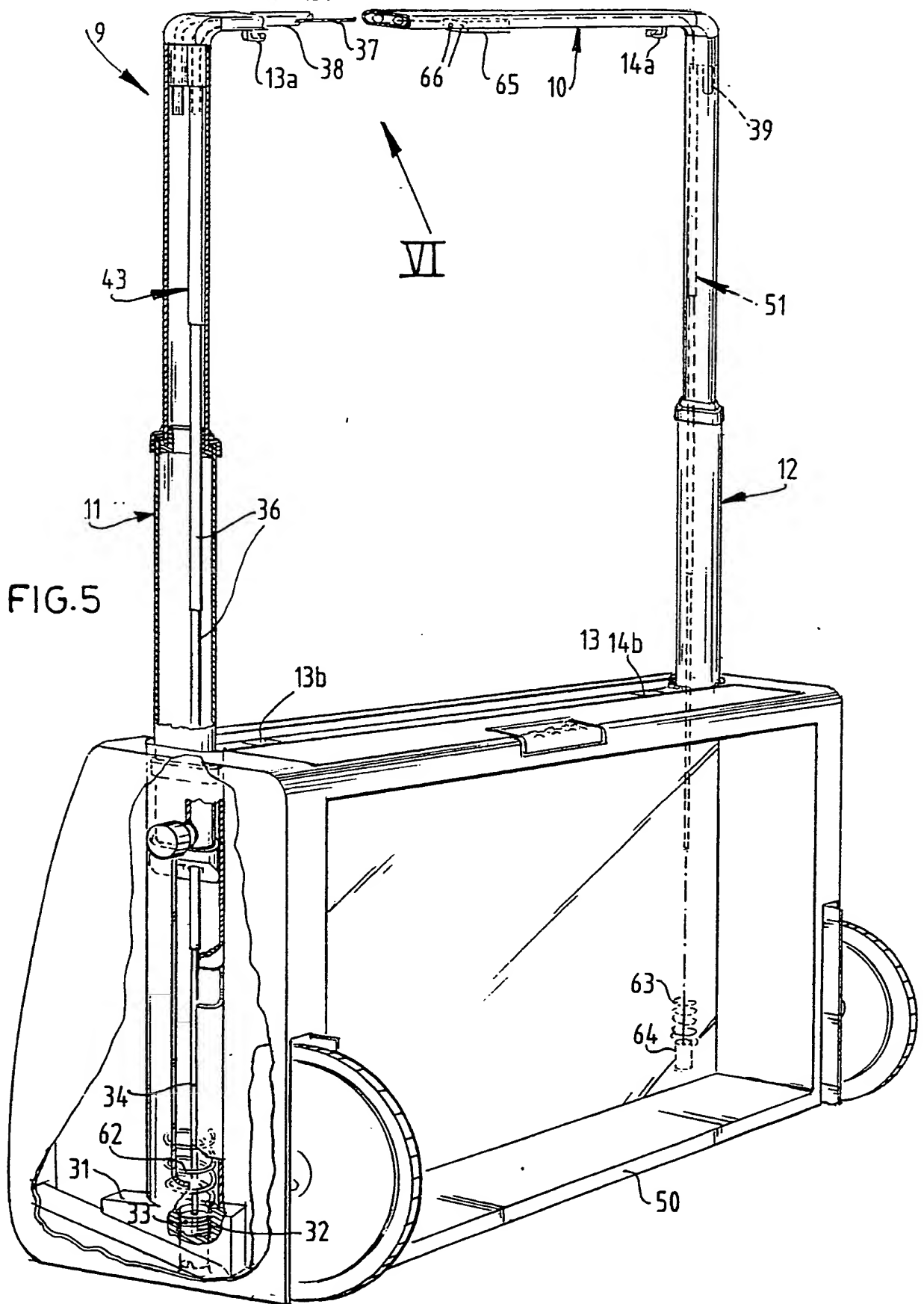
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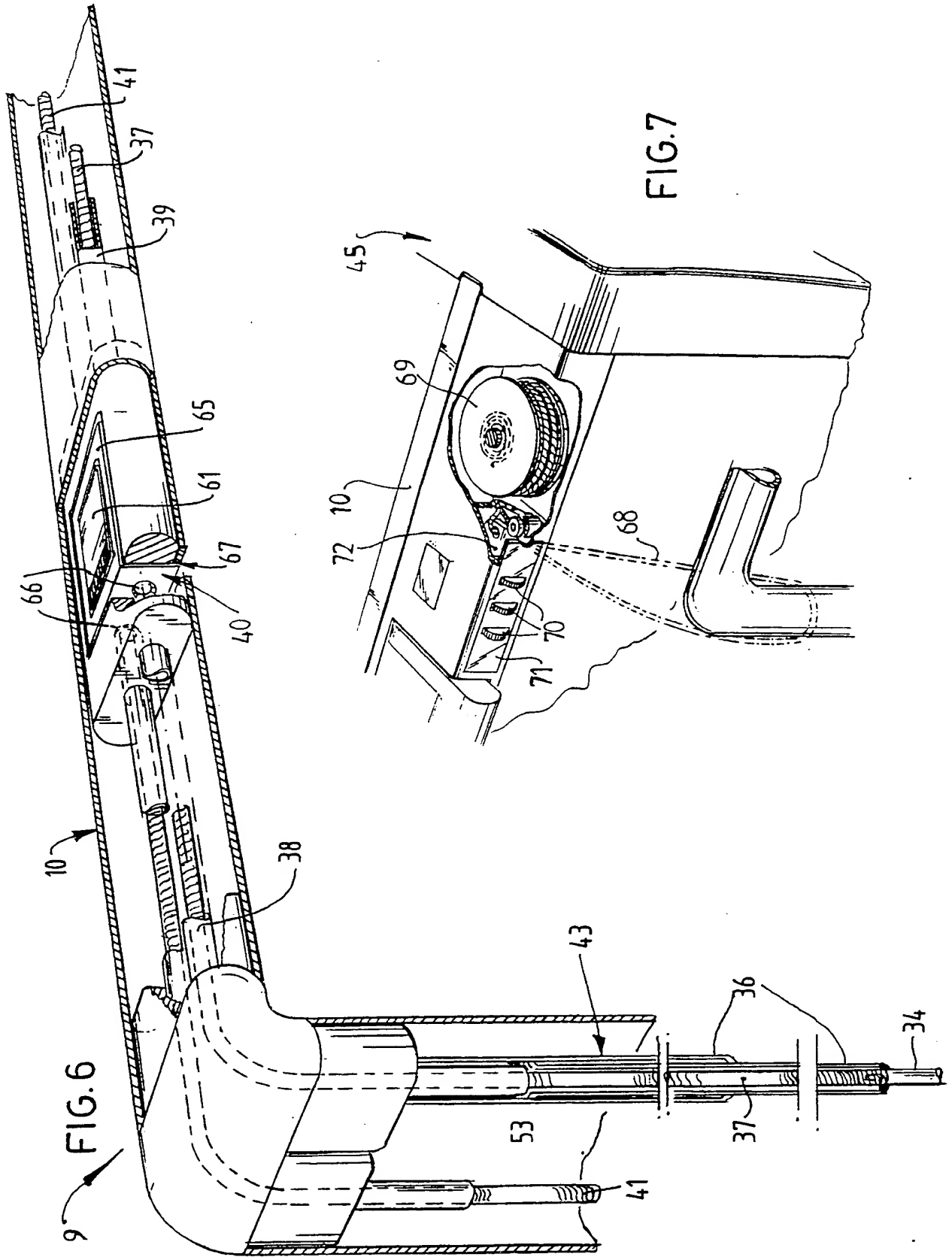








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| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|---|---|---|---|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.4) |
| A | FR-A-2206064 (THOMSEN) * page 4, line 18 - page 6, line 18; figures 1-6 * | 1 | A45C5/14 |
| A | US-A-4254850 (KNOWLES) * the whole document * | 1 | |
| A | US-A-2510754 (NORLIN) | | |
| A | US-A-4087102 (SPRAGUE) | | |
| A | US-A-2581417 (JONES) | | |
| | | | TECHNICAL FIELDS SEARCHED (Int. Cl.4) |
| | | | A45C B62B |
| The present search report has been drawn up for all claims | | | |
| Place of search THE HAGUE | | Date of completion of the search 02 OCTOBER 1989 | Examiner SIGWALT C. |
| CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons & : member of the same patent family, corresponding document | | | |

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